IMPACTS OF POOR WATER QUALITY ON ADJACENT PROPERTY OWNERS

Edmond A. Mayhew

AUTHOR: Professor of Biology; Science and Technology Department, Gainesville College, Gainesville Georgia 30503.
REFERENCE: *Proceedings of the 1997 Georgia Water Resources Conference*, held March 20-22, 1997, at The University Of Georgia, Kathryn J. Hatcher, Editor, Institute of Ecology, The University of Georgia, Athens Georgia.

Abstract. The impact of poor water quality on adjacent property owners is assumed to be both positive and negative. A few water users who need large quantities are benefited by price reductions as quality decreases, most users are harmed. Redress for those who are harmed is difficult but possible with point dischargers. Nonpoint sources of pollution have the standard water quality problems but the addition of increased flow - or surge which produces erosion and sedimentation makes it far more difficult to obtain redress. Surges are the single largest cause of water quality loss in the state. Loss of property directly through erosion was measured along Flat Creek. A corresponding loss in the attributed property value also occurred from the surges. In Lake Lanier the deposition of the sediment load causes the effective loss in property value which is determined by proximity to the lake. It also causes loss in lake use and in the need for dock rampways to bridge the silted in cove. Surges can be controlled and normally this flow reduction aids in the ancillary water quality problems.

INTRODUCTION

An impact is a continuing powerful influence and, like those in physics it is assumed that water quality impacts can be both positive and negative. This being the case, there are people who benefit and others who lose from water quality problems. The winners would be anyone who gains when property values fall, or need water in large quantity or are just interested in the flow characteristics. Large industry, navigation, irrigation (possibly), hydropower and bulk waste producers fit these use categories. Awareness of environmental issues has decreased the move for poor water quality in the above listed users. The situation has also been improved with the adoption of the Clean Water Act. The losers from water degradation actions are the adjacent property owners including those downstream from the problem source. These problems result from the wide range of pollutants commonly found in water.

The adjacent property owners can find redress in EPD or more commonly through legal actions. The basic problem in redress situations is proving that harm has occurred. The bad part is, few mechanisms exist to quantify losses incurred from even the most severe water quality problems. The good part is, the source of the problem is known. A large polluter has a pipe and is a point source. The effect of the pollutant on a neighbor may be debated but the source is not.

The problem of assigning responsibility is more difficult when no identifiable source exists. This is the condition for the majority of water quality problems in Georgia (EPD 1988,1990 and 1992). Nonpoint source pollution is the most rapidly growing problem in the state, and has been difficult to handle. If the pollution content of nonpoint source discharge is the only concern, the documentation of harm problem is difficult, and the assignment of liability to a responsible party is nearly impossible. An unusual situation exists here, not only is assigning blame difficult, but any attempt to document a gain is equally difficult.

Nonpoint source problems are thought of as urban problems, and much work has been done in that setting. Lumb, Wallace and James (1974) found that a 35% increase in paved area resulted in a 17% increase in peak flow - here after called surge. Work in the upper Chatahoochee River basin indicated that urban and rural streams were affected (Feye, Carey, Stamer and Kleckner 1980). The sheet erosion in rural areas was replaced by stream bed erosion in urban settings. The surge in rural areas can be severe, as shown in the 1993 floods in the midwest. Loss in wetlands, over 85% drained since the 1780's in Illinois, Indiana, Iowa, Missouri, and Ohio (Joens,1993); coupled with upland drainage and land clearing, has resulted in a 250 to 400 fold increase in mean annual surge since the late 1800's (Apfelbaum, 1993). The emphasis in water studies is weighted toward pollution loadings (Feye, Carey, Stamer and Kleckner 1980). However, in nonpoint source problems it is the surge that is the more consistent problem (Berg and Clement 1992, and Meyer, Marsalek and Reyes 1996, Apfelbaum 1993 and Joens 1993). The water quality in the State of Georgia has exhibited severe surges, but these floods have not been emphasized by the EPD in their reports, nor were the suspended solids they carried covered (EPD 1988, 1990 and 1992).

Surges and their suspended load have an effect upon adjacent property that is the topic of this paper. The harm produced will be presented as a dollar loss in real estate lot values. The absence of public acknowledgement of surge damage is not an indication either of their lack of severity or rarity. Surges are the single most likely water quality problem where there are people.

METHODS

The study area is Flat Creek, an urban and semi rural stream that drains the city of Gainesville and Hall County, and flows into Lake Lanier. The property along the rural portion of the stream is within the North Georgia corridor of growth. Property values have risen annually in the corridor and along the lakefront. The real estate boom has fueled the local economy since the late 1950's. Actions to have the US Corps of Engineers limit drawdown levels and to accept recreation as a legal use for the operational plan to direct Lake Lanier are commonplace. Property on the lake and the scenic places along the creek are prized.

Real estate listings of land lots without houses were obtained from two sources (the Real Estate Book 1997, and North Georgia Select Homes 1997) and average asking prices for four categories were obtained. Two categories were selected for riverine lots: Scenic Stream and Chattahoochee River and Stream. Three categories were selected for lake lots: Deep Water, Lake Access, and Lake View. These are terms that alert the reader to values assigned to the property, and are used here to obtain market pricing for the land.

The averages for the lots were plotted by linear regression where possible, to obtain the square foot per dollar values from the best lots, those nearest the lake, back to the least valued ones.

On Flat Creek, the average prices for the Scenic lots were applied to land in the process of being lost due to erosion. On the remaining land a depreciation value was applied, equivalent to moving the lot to the Stream category as if scenic value were lost.

A standard lot size of 0.7 acres was used for all listings that just gave a price per lot. All lots were assumed to be square for geometric comparisons. The center of the lot was used to compute distances. In the case of lake lots, where there were three categories, a 30 foot road was arbitrarily placed between the lots.

RESULTS

The price per lot where the lot size was 0.7 acres is presented in Table 1. The measured erosion along the stream was .15 acres and the volume lost was 0.11 acre feet. This occurred on both sides of the stream. The removal of land from a lot assigned the Scenic stream value, and the conversion of that land to the Stream value because of damage in quality, makes a major change in asking price. On a property of 5 lots that has these changes, there is a $1988 loss on both sides of the stream. This does make the assumption that the Flat Creek land is valued at a scenic rate initially.

Table 1. Asking Price Per Lot for Undeveloped Land as Related to Position Near a Water Resource.

Lot Type	Asking Price ($)	Base No. FT	Distance to Lakeshore
	LAKE		
Deep	63156	47	491
Access	30532	18	695
View	17371	3	899
	STREAM		
Scenic	3368	9	---
Stream	2854	5	---

The coves around the lake are the sites for boat docks and lake access for private property owners. Coves are the lake areas subject to deposition from the longshore currents and the influent streams. A linear regression was completed comparing the distances from shoreline, to property center, and the lot values. The results indicated an asking price of $112/each foot from the lake. The erosion rate measured from the 10 lots on Flat Creek, if delivered to one lot on the cove would result in a setback of one half foot. The change in position of that lot is $56. This is the loss only to the shoreline lot from the eroded material from 10 lots on the creek.

The calculated erosion occurred in one winter from only ten lots. Another price is paid by lake lot owners, in the effort often needed to reposition boat docks and in the purchase needed rampways. A 5 foot ramp section is required in ten years at the estimated rate, just to reach the lake. The lot value lost is much greater than here shown. The property is changing from a Deep Water to a Shallow Water lot. The latter is NOT a category emphasized in the real estate booklets. The actual fill rate for cove lots is much greater than the calculated. A twenty foot wide silt bank is in place now. The only reason it is not thicker and wider is, during drawdown, the bank is reeroded and the material moved to the lake center. A cove in Forsyth County is completely landlocked in early summer. In that cove there are only Lake View lots at that time.

CONCLUSIONS

Surges and the associated sediment loadings have a measurable effect upon the land values of nearby property owners. If computed along the entire stream, the land losses and evaluation losses are enormous. The effect upon the cove lots is also great if computed around the lake. Surge flows have sufficient economic impact that they should be addressed even without the concurrent problems of water quality degradation. Both sets of problems can be reduced by requiring land disturbing actions to be accompanied with and followed by corrective actions. The presence of terraces, increasing the roughness in stream beds and diversion of roof drains to land rather than directly to the stream, were recommended by Lumb, Wallace and James (1974). The use of detention basins in the upper portion of the stream is effective, if properly designed (Mayer, Marsalek and Reyes 1996). The reintroduction of wetlands in the correct location and configuration is still more effective (Joens 1993; Apfelbaum 1993). These are but a few of the possibilities. In Maryland a park was designed as a showcase to illustrate methods for surge control (Berg and Clement, 1992). This park was designed to dispel the beliefs that surge control structures are not attractive or useful.

Until there is a clear reason for controlling surges along with a modicum of planning, financial support and leadership, there will be no effective action on nonpoint source pollution. The knowledge that there is a loss in property area and in its value occurs may be a first step. The second step is to gain control of development and the resultant surges. Only when surge reduction devices are in place will there be a chance to regulate the other water quality problems that are present in stormwater. In the 1992 EPD report, there was a discussion of a constructed wetland that has shown a 95% decresase in nutrient loadings to a waterway. The more effective surge control devices will also help with the water quality loss.

BIBLIOGRAPHY

Apfelbaum S. 1993. The Future of Flooding. *Land and Water* 37:61-62.

Berg,V.H. and P.F. Clement. 1992. Maryland's Stormwater Park Brings Control to Runoff. *Land and Water* 36: 26-31.

E.P.D. *Water Quality in Georgia, The Reports for 1988, 1990 and 1992.* Georgia Department of Natural Resources, Environmental Protection Division.

Faye, R.E., W.P.Carey, J.K.Stamer and R.L.Kleckner. 1980. Erosion, Sediment Discharge, and Channel Morphology in the Upper Chatahoochee River Basin, Georgia, U.S.Geological Survey Professional Paper 1107, pp 85.

Joens J. 1993. Wetlands and Watersheds. *Land and Water* .37: 54-57.

Lumb, A.M., J.R. Wallace and L.D. James. 1974. Analysis of Urban Land Treatment Measures for Flood Peak reduction, Environmental Resources Center Georgia Institute of Technology, Office of Water Resources Research, U.S. Department of the Interior, PL88-379 OWRR Project No.C-2064, pp. 146.

Meyer, T., J. Marsalek and E.D.Reyes. 1996. Nutrients and Metal Contaminants Status of Urban Stormwater Ponds. *Lake and Reservoir Management*, NALMS 12(3):348-363.